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ENVIRONMENTAL PROTECTION AGENCY

[EPA-R09-OAR-2015-0779; FRL-9940-06-Region 9]

Official Release of EMFAC2014 Motor Vehicle Emission Factor

Model for Use in the State of California

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of availability.

SUMMARY: The Environmental Protection Agency (EPA) is approving and announcing the availability of the latest version of the California EMFAC (short for Emission FACtor) model for use in state implementation plan (SIP) development and transportation conformity in California. EMFAC2014 is the latest update to the EMFAC model for use by California state and local governments to meet Clean Air Act (CAA) requirements. The new model, which is based on new and improved data, calculates air pollution emissions factors for passenger cars, trucks, motorcycles, motor homes and buses. Today's notice also sets the date after which EMFAC2014, rather than EMFAC2011, must be used to satisfy the requirement that conformity determinations be based on the latest emissions model available. This requirement can be met by using the most current version of the motor vehicle emissions model approved by the EPA. Since the EMFAC model is used only in California, the EPA's approval and the announcement of the

availability of the model does not affect the applicability of the Motor Vehicle Emissions Simulator (MOVES) model for users in other states.

DATES: The EPA's approval of the EMFAC2014 emissions model for SIP and conformity purposes is effective [**INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER**]. EMFAC2014 must be used as described in this Notice for all new regional emissions analyses and carbon monoxide (CO) and particulate matter (PM₁₀ and PM_{2.5}) hot-spot analyses for transportation conformity purposes that are started on or after [**INSERT DATE 24 MONTHS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER**].

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SUPPLEMENTARY INFORMATION: Copies of the official version of the EMFAC2014 model, including technical support documents, are available on the California Air Resources Board (CARB) web site: http://www.arb.ca.gov/msei/categories.htm#onroad_motor_vehicles.

Throughout this document, "we," "us" and "our" refer to EPA.

I. Background

A. What Is the EMFAC Model?

The EMFAC model is a computer model that can estimate emission rates for on-road mobile sources ("motor vehicles") for calendar years from 2000 to 2050 operating in California. Pollutant emissions for hydrocarbons (HC), CO, nitrogen oxides (NO_x), PM₁₀, PM_{2.5}, lead, carbon dioxide (CO₂), and sulfur oxides are output from the model. Emissions are calculated for fifty-one different vehicle classes composed of passenger cars, various types of trucks and buses, motorcycles, and motor homes.

EMFAC is used to calculate current and future inventories of motor vehicle emissions at the state, air district, air basin, county, or project level. EMFAC contains default vehicle activity data, and the option of modifying that data, so it can be used to estimate a motor vehicle emissions inventory in tons/day for a specific year, month, or season, and as a function of ambient temperature, relative humidity, vehicle population, mileage accrual, miles of travel and speeds. Thus the model can be used to make decisions about air pollution policies and programs at the local or state level.

Inventories based on EMFAC are also used to meet the federal CAA's SIP and transportation conformity requirements. Transportation conformity is required under CAA section 176(c) to ensure that federally supported transportation plans,

transportation improvement programs (TIPs), and highway and transit projects are consistent with ("conform to") the purpose of the SIP. Conformity to a SIP means that a transportation activity will not cause or contribute to new air quality violations, worsen existing violations, or delay timely attainment of the national ambient air quality standards (NAAQS) or interim milestones. The EPA's transportation conformity regulations (40 CFR parts 51.390 and 93) describe how federally funded and approved highway and transit projects meet these statutory requirements. EMFAC is used statewide in all regional emissions analyses and CO, PM₁₀ and PM_{2.5} hot-spot analyses for transportation conformity determinations in California.

B. What Versions of EMFAC Are Currently in Use in California?

Most SIPs in California were developed using EMFAC2011 (released by CARB in September 2011) or EMFAC2007 (released by CARB in October 2007). The EPA approved and announced the availability of EMFAC2011 on March 16, 2013 (78 FR 14533) and approved and announced the availability of EMFAC2007 on January 18, 2008 (73 FR 3464) for all nonattainment and maintenance areas in California.

EMFAC2011 was considered a major update to previous versions of EMFAC and most SIPs in California were updated with

EMFAC2011 in the 2012-2014 timeframe. EMFAC2011 included a new model structure, new data and methodologies regarding calculation of motor vehicle emissions, and revisions to implementation data for control measures.

C. Why Is the EPA Announcing Its Approval of the EMFAC Model?

CAA section 172(c)(3) and 40 CFR 51.114(a) require that SIP inventories be based on the most current, accurate, and applicable models that are available at the time the SIP is developed. CAA section 176(c)(1) and 40 CFR 93.111(a) require that the latest emissions estimates be used in conformity analyses. The EPA approves models that fulfill these requirements.

Under 40 CFR 93.111(a), the EPA must approve new versions of EMFAC for SIP purposes before they can be used in transportation conformity analyses. In a May 21, 2015 letter, CARB requested that the EPA approve EMFAC2014 for use in developing SIPs and in determining conformity in California.¹ EMFAC2014 is a significant change from previous EMFAC models with a new model user interface and is capable of calculating

¹ The EMFAC2014 model and supporting information is available for downloading at http://www.arb.ca.gov/msei/categories.htm#onroad_motor_vehicles. Technical documentation explaining the changes to the model and the technical foundations for the model is available at <http://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf>.

motor vehicle emissions for all California areas. EMFAC2014 is being approved as the latest emissions model for statewide use in SIP development and emissions analyses for conformity purposes. Since the EMFAC model is only used in California, the EPA's statewide approval of the model does not affect the applicability of the MOVES emissions factor model for users in other states.

II. EPA Action

A. What Version of EMFAC Is the EPA Approving?

In this notice, the EPA is approving and announcing that EMFAC2014 is available to use in statewide California SIP development and for regional emissions analyses and CO, PM₁₀ and PM_{2.5} hot-spot analyses for transportation conformity. EMFAC2014 was developed by CARB and transmitted for approval to the EPA on May 21, 2015.

The EMFAC2014 model has been rewritten using Python and MySQL software into a new structure that will facilitate future model updates, and allow CARB to incorporate updated regulations and emissions data into the model and provide for a more simplified user experience. The four major modules of EMFAC2011: EMFAC-LDV, EMFAC-HD, EMFAC-SG and EMFAC-PL have been integrated into EMFAC2014, under one interface. The model is now operated

in either the Emissions Mode or the Emissions Rate Mode for regional emissions analyses to access emission databases and vehicle activity data for the appropriate geographic subarea. EMFAC2014 Project-Level Assessment (EMFAC2014-PL) is triggered when EMFAC2014 is run under the Emissions Rate Mode. Using EMFAC2014-PL, emissions rates are estimated based on user-specified, project-specific conditions. A handbook for using EMFAC2014 at the project level is available from CARB at: <http://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol2-pl-handbook-052015.pdf>. EMFAC2014 allows users to run one model for SIP inventories, regional emissions analyses and project analyses.

B. What Analyses Can EMFAC2014 Be Used for?

The EPA is approving the model to estimate regional emissions of HC, CO, NO_x, PM₁₀, PM_{2.5}, lead, and sulfur oxides.² However, EMFAC2014 will only be used in transportation conformity for pollutants and precursors that are transportation-related emissions, e.g., HC, CO, NO_x, PM₁₀ and PM_{2.5}.

² The EPA notes that EMFAC2014 can be used for CO₂ emissions analyses as well, but there are no SIP or transportation conformity requirements for greenhouse gases (GHGs). In addition, although SO₂ is listed as a potential precursor for PM_{2.5} formation in 40 CFR 93.102(b)(2)(v), this precursor has not been considered significant for the on-road mobile sources covered by transportation conformity in California to date.

The EPA is also approving EMFAC2014 to estimate CO, PM₁₀ and PM_{2.5} emissions for conformity hot-spot analyses involving individual transportation projects. A hot-spot analysis is defined in 40 CFR 93.101 as an estimation of likely future localized pollutant concentrations and a comparison of those concentrations to the relevant NAAQS. This analysis is conducted on a smaller scale than a nonattainment or maintenance area, e.g., for a congested roadway intersection.

The EPA also notes that this approval action does not impact what methodology is required for calculating re-entrained road dust for regional PM₁₀ and PM_{2.5} SIPs and transportation conformity analyses. EMFAC2014's PM₁₀ and PM_{2.5} estimates do not include such emissions. When applicable, PM₁₀ and PM_{2.5} nonattainment and maintenance areas are required to use the EPA's AP-42 road dust method for calculating road dust emissions, unless a local method is approved in advance by the EPA.³ In addition, EMFAC2014 does not estimate ammonia emissions. Air quality and transportation agencies should contact the EPA

³ For further information, see the EPA's February 4, 2011 Notice of Availability for the January 2011 AP-42 Method for Estimating Re-entrained Road Dust from Paved Roads (76 FR 6328). Also, for using AP-42 for unpaved roads, see the EPA's August 2, 2007 memorandum, "Policy Guidance on the Use of the November 1, 2006, Update to AP-42 for Re-entrained Road Dust for SIP Development and Transportation Conformity."

Regional Office if ammonia emissions estimates are needed for SIPs or regional conformity emissions analyses.

C. Why Does the EPA Consider EMFAC2014 to Be a Major Update to EMFAC?

EMFAC2014 includes significant changes to its model interface, new data and methodologies regarding calculation of motor vehicle emissions and revisions to implementation data for control measures. EMFAC2014 includes updated data on car and truck activities, and emissions reductions associated with CARB's Advanced Clean Cars regulations⁴, supporting new estimates of emissions from heavy-heavy duty diesel trucks and buses. Motor vehicle fleet age, vehicle types and vehicle population have also been updated based on 2000-2012 California Department of Motor Vehicle (DMV) data. Each of these changes impact emission factors for each area in California. The new model interface for EMFAC2014 will allow users to update the default VMT data and speed profiles by vehicle class for different future scenarios. CARB's web site describes these and other model changes at:

[http://www.arb.ca.gov/msei/categories.htm#onroad_motor_vehicles.](http://www.arb.ca.gov/msei/categories.htm#onroad_motor_vehicles)

⁴ For further information, see EPA's January 9, 2013 waiver of preemption for the Advanced Clean Cars regulations at <http://www.gpo.gov/fdsys/pkg/FR-2013-01-09/pdf/2013-00181.pdf>.

D. How Were Stakeholders and the Public Involved in the EMFAC Development Process?

Since 2013, CARB has held a series of public workshops to discuss emissions inventory updates and EMFAC updates and to receive comments on the resulting changes in the emissions inventory and models.⁵ CARB also conducted beta testing of interim versions of the model with air districts and Metropolitan Planning Organizations (MPOs). Stakeholders and other members of the public had the opportunity to request briefings with CARB staff and provide them with comments and suggestions to improve the model. The EPA was included in those discussions and our suggestions were incorporated into the material available on the CARB EMFAC public web site. CARB also developed and posted training modules for EMFAC2014 and supports a mobile source emissions inventory email listserv to announce updates and changes to the EMFAC supporting material.⁶

CARB also made available to the public a series of technical memos that describe each update to the model and public presentations that summarize the changes from earlier versions of the model. The technical memos are available on

⁵ See <http://www.arb.ca.gov/msei/workshop-meetings.htm>.

⁶ To subscribe to CARB's listserv for Mobile Source Emission Inventory development, see "Join our MSEI listserv" at www.arb.ca.gov/msei/msei.htm.

CARB's web site at:

<http://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol4-comp-table-of-emfac-topics-052015.xlsx> and at

http://www.arb.ca.gov/msei/categories.htm#onroad_motor_vehicles

Specific changes incorporated into the EMFAC2014 model are also discussed in

<http://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf>. All presentations from the public workshops are available on the CARB web site at:

<http://www.arb.ca.gov/msei/workshop-meetings.htm>.

E. Does this Notice Establish a Transportation Conformity Grace Period for the Use of this Model?

Yes. The transportation conformity rule (40 CFR 93.111) requires that conformity determinations be based on the latest motor vehicle emissions model approved by the EPA for SIP purposes for a state or area. Section 176(c)(1) of the CAA states that

" . . . [t]he determination of conformity shall be based on the most recent estimates of emissions, and such estimates shall be determined from the most recent population, employment, travel, and congestion estimates. . . ."

When the EPA approves and announces the availability of a new emissions model such as EMFAC2014, the EPA will consult with the U.S. Department of Transportation (DOT) to establish a grace period before the model is required for conformity analyses (40 CFR 93.111(b)). The conformity rule provides for a grace period for new emissions models of between 3 and 24 months after notice of availability is published in the **Federal Register** (40 CFR 93.111(b)(1)).

The EPA articulated its intentions for establishing the length of a conformity grace period in the preamble to the 1993 transportation conformity rule (November 24, 1993, 58 FR 62211):

"EPA and DOT [the Department of Transportation] will consider extending the grace period if the effects of the new emissions model are so significant that previous SIP demonstrations of what emission levels are consistent with attainment would be substantially affected. In such cases, States should have an opportunity to revise their SIPs before MPOs must use the model's new emissions factors."

In consultation with the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA), the EPA considers "the degree of change in the model and the scope of re-planning likely to be necessary by MPOs in order to assure

conformity" in establishing the length of the grace period (40 CFR 93.111(b)(2)).

Upon consideration of these factors, the EPA is establishing a two-year grace period before EMFAC2014 is required for the following conformity analyses:

- All new HC, NO_x, PM₁₀, PM_{2.5} and CO regional emissions analyses (e.g., supporting transportation plan and TIP conformity determinations); and
- All new CO, PM₁₀ and PM_{2.5} hot-spot analyses supporting project-level conformity determinations.

The grace period begins on [**INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER**] and ends on [**INSERT DATE 24 MONTHS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER**]. Areas have the option of using the new model prior to the end of the grace period.

As discussed earlier in the notice, EMFAC2014 incorporates significant changes to the model interface and procedures used to estimate both emissions for regional emissions analysis and hot-spot analyses for CO and PM. In addition to incorporating the new EMFAC2014 procedures, state and local agencies also need to consider how the model affects regional conformity analysis results and whether SIP and/or transportation plan/TIP changes are necessary to assure future conformity determinations. As

stated earlier in the notice, the changes to EMFAC impact emission factors for each area in California. CARB has requested an 18-month grace period to allow them to update SIPs previously developed using EMFAC2007 or EMFAC2011 with the updated emissions from EMFAC2014 during 2016. Therefore, additional time is necessary for CARB to revise previously approved SIPs with EMFAC2014 and complete the SIP revision process, so that MPOs can incorporate revised SIP budgets into the transportation conformity process.

For application of EMFAC2014 at the project level, while EMFAC2014 was originally released by CARB in October of 2014, project sponsors developing future project-level analysis may need some time to familiarize themselves with this model.

Therefore, it is appropriate to set a two-year grace period to allow all areas in California to incorporate EMFAC2014 in conformity hot-spot analyses and apply the changes to the model structure and updated planning assumptions incorporated in EMFAC2014 in a timely manner. In the interim, new PM and CO hot-spot analyses that are started prior to the end of the EMFAC2014

grace period can be based on EMFAC2011 and the EPA's existing PM hot-spot guidance⁷ (40 CFR 93.111(c)).

When the grace period ends on [**INSERT DATE 24 MONTHS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER**], EMFAC2014 will become the only approved motor vehicle emissions model for all new regional and hot-spot transportation conformity analyses across California, as a means of meeting the requirement to use the latest emissions information in conformity analyses (40 CFR 93.111). In general, this means that all new HC, NO_x, PM₁₀, PM_{2.5}, and CO regional conformity analyses and CO, PM₁₀ and PM_{2.5} hot-spot analyses started after the end of the two-year grace period must be based on EMFAC2014, even if the SIP is based on an earlier version of the EMFAC model. The EPA is considering what project-level guidance is necessary for EMFAC2014 and will make information available on the EPA's website: www.epa.gov/otaq/stateresources/transconf/projectlevel-hotspot.htm.

In addition, in most cases, if an area revises previously approved EMFAC2011-based SIP budgets using EMFAC2014, the revised EMFAC2014 budgets would be used for conformity purposes

⁷ See webpage <http://www3.epa.gov/otaq/stateresources/transconf/projectlevel-hotspot.htm#pm-hotspot> for latest guidance documents and information.

once the EPA approves the SIP revision. In general, the EPA will not make adequacy findings for these SIPs because submitted SIPs cannot supersede approved budgets until they are approved.

However, 40 CFR 93.118(e)(1) allows an approved budget to be replaced by an adequate budget if the EPA's approval of the initial budgets specifies that the budgets being approved may be replaced in the future by new adequate budgets. This flexibility has been used in limited situations in the past, such as during the transition from EMFAC7F and EMFAC7G to EMFAC2002. See 67 FR 46618 (July 16, 2002); 67 FR 69139 (November 15, 2002); and 68 FR 15720 (April 1, 2003). In such cases, the EMFAC2014-based budgets would be used for conformity purposes once they have been found adequate. States should consult with the EPA as needed to determine if this flexibility applies to their situation.

F. Can Areas Use EMFAC2011 During the Grace Period?

Yes, the conformity rule provides some flexibility for regional emissions analyses that are started before the end of the grace period. Analyses that begin before or during the grace period may continue to rely on EMFAC2011. The interagency consultation process should be used if it is unclear if an EMFAC2011-based analysis was begun before the end of the grace

period. When the grace period ends, EMFAC2014 will become the EPA-approved motor vehicle emissions model for regional emissions analyses for transportation conformity in California.

CO, PM₁₀ and PM_{2.5} hot-spot analyses for project-level conformity determinations can be based on EMFAC2011 if the analysis was begun before the end of the grace period, and if the final environmental document for the project is issued no more than three years after the issuance of the draft environmental document (see 40 CFR 93.111(c)). Therefore quantitative analysis already underway that were started before the end of the grace period using EMFAC2011 can be completed as long as 40 CFR 93.111(c) is satisfied. The interagency consultation process should be used if it is unclear whether an EMFAC2011-based analysis is covered by the circumstances described in the conformity rule.

G. Future Updates to EMFAC

On January 31, 2006, CARB submitted a letter to the EPA and to the California Division of the FHWA indicating the State's intention to make future revisions to update EMFAC. These EMFAC updates would reflect, among other new information, updated vehicle fleet data every three years. In California, MPOs and Air Districts have not been able to update vehicle fleet data

embedded into EMFAC. The EPA's July 2004 final rule (69 FR 40004) states that new vehicle registration data must be used when it is available prior to the start of new conformity analyses and that states and MPOs are strongly encouraged to update the data at least every five years as described in EPA/USDOT December 2008 guidance.⁸ The next update to the planning assumptions in EMFAC is expected in 2017.

III. Summary of EPA Actions

As described in this notice, the EPA is approving and announcing the availability of EMFAC2014 as submitted by CARB on May 21, 2015 with the following limitations and conditions:

- (1) The approval is limited to California.
- (2) The approval is Statewide and applies to estimation of emissions of HC, CO, NO_x, PM₁₀, PM_{2.5}, lead, and sulfur oxides. In addition, EMFAC2014 will be used in transportation conformity regional emissions analyses for pollutants and precursors that are applicable in a given nonattainment or maintenance area. The EPA is approving the emission factor elements of EMFAC2014, but not the associated default travel activity (e.g. Vehicle Miles

⁸ For more information on qualitative PM hot-spot analyses, see the EPA and the FHWA's joint "Guidance for The Use of Latest Planning Assumptions in Transportation Conformity Determinations" (EPA420-B-08-901, December 2008).

Traveled). The EPA is also approving EMFAC2014's Emission Rate Mode that allows the model to estimate project-level emissions for CO, PM₁₀ and PM_{2.5} conformity hot-spot analyses.

- (3) A 24-month statewide transportation conformity grace period will be established beginning [**INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER**] and ending [**INSERT DATE 24 MONTHS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER**] for the transportation conformity uses described in (2) above.

Dated: December 2, 2015.

Jared Blumenfeld,
Regional Administrator,
Region IX.

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